

# PATENT SPECIFICATION

313,896



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Complete Left: Dec. 13, 1928.

Complete Accepted: June 17, 1929.

## PROVISIONAL SPECIFICATION.

### Improvements in and relating to the Springing of Vehicles.

I, PETER LUDVIG NEGITHON, of Danskesvej 82, Copenhagen, Denmark, of Danish Nationality, do hereby declare the nature of this invention to be as follows:—

The object of this invention is to provide an arrangement of springs, more particularly for motor driven vehicles, which will be extremely efficacious in eliminating shocks and, whilst the springing provides great resiliency, bouncing of the vehicle body will not occur owing to the employment of springs which flex in opposite directions.

The system of springing is especially applicable to motor driven cars of light construction.

There are secured by brackets or other means, to the sides of the car frame, protective casings for the springs and they and the springs and other parts of mechanism therein are the same, and therefore a description of one of the springing devices will suffice.

The casing is segmental in shape, the pointed part of it being secured to the vehicle frame between an axle and the centre of the vehicle.

Within the casing at the aforesaid pointed part and which has the least depth, there is hinged to a bracket on the vehicle frame a plate of which the end which is removed from the hinge can rock up and down within that part of the casing which is of greatest depth, the end of the plate being turned upwards to conform to the interior surface of the end of the casing and has a slot to receive the head of a pin which projects inwardly from the end of the casing to form a stop to limit the amplitude of the plate. The plate extends over the axle and is held thereon by a bracket or bearing on the underside of the plate, the inner side wall of the

casing having a curved elongated opening to permit of vertical movement of the axle.

A series of coiled springs are arranged on the upper surface of the plate and their ends rest in recessed bosses on the plate and the inner top surface of the casing.

The bosses on the plate have lugs on their underside which project through the plate and have attached thereto the ends of springs of which the other ends are attached to the lugs on the inner surface of the bottom of the casing. The plate and axle therefore oscillate between springs which compress between the plate and top of the casing and springs which elongate between the plate and the bottom of the casing.

In addition to the springs there may be a leaf spring which has one end rigidly attached to the casing near to the part which envelopes the hinge of the plate and it extends, in curved formation, below the casing and has its other end secured to the axle, this end of the spring being bifurcated so that an arm of it extends upwards to the axle on each side of the casing.

In an alternative construction, the hinged plate has side flanges which, with the curved end flange constitute the lower half of the casing, the end and side flanges fitting and sliding upwardly within the upper part of the casing. In this construction there is only one set of springs, viz., those which are between the upper surface of the hinged plate and the inner surface of the top part of the casing. The flat spring, before described can be used in this construction if desired.

Dated this 16th day of March, 1928.

CHATWIN & COMPANY,  
253, Gray's Inn Road, London, W.C. 1,  
Patent Agents for the Applicant.

## COMPLETE SPECIFICATION.

### Improvements in and relating to the Springing of Vehicles.

I, PETER LUDVIG NEGITHON, of Danskesvej 82, Copenhagen, Denmark, of Danish Nationality, do hereby declare the nature of this invention and in what [Price 1/-]

manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of this invention is to provide

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an arrangement of springs, more particularly for motor driven vehicles, which will be extremely efficacious in eliminating shocks and, whilst the springing provides great resiliency, jumping of the vehicle body will not occur owing to the employment of springs which flex in opposite directions.

The present invention relates to a spring suspension for motor vehicles or the like, which is intended to serve as a substitute for the hitherto employed leaf spring. Spring suspensions for motor vehicles or the like are already known, in which the wheel axle is connected with the two longitudinal supports of the vehicle frame by means of two longitudinal guide members capable of swinging around front cross bolts of the said supports, said guide members being supported against the said supports by means of helical compression springs. The device according to the invention is characterised in that each longitudinal guide member is constructed in the form of an oscillating intermediate part or bottom part respectively of a longitudinal casing, which is fixed to the longitudinal support or is formed by this latter and is closed or open underneath, the said casing forming a common protective casing for the helical compression springs and the cross bolt. Between the oscillating intermediate part and the bottom part of the casing springs subjected to tensile or compressive stress are arranged. On the oscillating intermediate part or bottom part respectively a vertical guide slot is provided and on the rear wall of the casing a corresponding guide bolt or the like is provided.

On the accompanying drawings two forms of construction are shown by way of example:—

Fig. 1 is a longitudinal section of a spring arrangement with a double set of springs for a rear wheel.

Fig. 2 is a cross section on line I—I of Fig. 1.

Fig. 3 is a side view and

Fig. 4 a rear view of the arrangement according to fig. 1.

Fig. 5 shows another form of execution with one set of springs in longitudinal section,

Fig. 6 is a cross section on line II—II of fig. 5,

Fig. 7 is a side view and

Fig. 8 a rear view of Fig. 5.

The vehicle frame 1 is provided on the side of each wheel with a casing 2 open towards below whereby the springs are protected. This casing is fixed behind on the vehicle frame by means of a plate 3. In the form of construction accord-

ing to figs. 1—4 this casing consists of several parts, the middle part of which is movably fixed to the upper part 2 by means of a bolt 5 which with the plate 3 also secures the upper part 2 to the vehicle frame 1. On the under side of the middle part or plate 4, a bearing 6 (figs. 1 and 2) for the reception of the tube 7 of the rear axle or of the front axle 8 (figs. 3 and 4) is provided. The lower part 9 of the casing is fixed on the upper part 2 and covers the middle part 4. This lower part is provided at the end remote from the bolt 5 with a flange fixed to the vehicle frame by means of an angle bar 10 and bolts or rivets. The upper part 2 is provided at the end remote from the bolt 5 with a pin 11, the head of which engages with a slot 12 in the end wall of the middle plate 4 by which arrangement movements in lateral direction of the middle plate 4 are avoided.

Between the upper part 2 and the middle plate 4 three spiral springs 13 are arranged which are formed as compression springs and their ends rest in recessed bosses 14 on the plate and the inner top surface of the casing. The bosses 14 on the plate are provided with lugs on their underside which project through the plate thereto are attached the ends of two springs 15 the other ends of which are attached to lugs on the inner surface of the bottom of the casing. The plate and the axle therefore oscillate between these springs which compress between the plate and top of the casing and springs which elongate between the plate and the bottom of the casing. The springs 15 can also be formed as compression springs.

If a pressure is exerted on the vehicle frame this pressure will be equalized by the spiral springs 13 and eventually by the springs 15 and on the other hand shocks during the driving of the vehicle will be in known manner equalized by the two sets of springs.

According to the second form of construction (figs. 5—8) which is especially applicable to motor driven cars or like vehicles, the casing consists only of two parts—the part 2 and the part 4a, one part is fixed movably to the other part. Only one set of springs 13 is provided and the object of these springs is the same as in the first form of construction. The other particulars such as the pin with slot for guiding the parts remain also the same.

As a new feature of this form of construction must be considered the arrangement of a leaf spring 16 which has one end rigidly attached to the casing near the part which envelopes the hinge of the bottom plate and it extends in curved formation below the casing and has its

other end secured to the axle, this end of the spring being bifurcated so that an arm of it extends upwards to the axle on each side of the casing. The object of this leaf spring is to avoid the vehicle tilting over if a wheel has been lost. In this case this spring acts like a slide shoe.

Other forms of construction of the spring arrangement than that above described in detail, fall within the scope of the invention. Thus for example the upper part of the protecting casing of the springs can form a part of the frame. The number and dimensions of the springs can be varied according to the different forms and dimensions of the vehicles which are provided with the new spring arrangement according to this invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A spring suspension for motor vehicles or the like, in which the wheel axle is connected with the longitudinal supports of the vehicle frame, which are arranged on the two sides, by means of two longitudinal guide members capable of swinging around front cross bolts of the said supports, said guide members being connected to the said supports through the

medium of helical compression springs, characterised in that each longitudinal guide member is constructed in the form of an oscillating intermediate part (4) or bottom part (4a) respectively of a longitudinal casing (2) which is fixed to the longitudinal support (1) or is formed by this latter and is closed or open underneath, the said casing (2) forming a common protective casing for the helical compression springs (13) and the cross bolt (5).

2. A spring suspension for motor vehicles or the like, according to Claim 1, characterised in that springs (15) of a kind known per se, which are subjected to tensile or compressive stress, are arranged between the oscillating part (4) and the lower part (9) of the casing.

3. A spring suspension for motor vehicles or the like, according to Claim 1 or 2, characterised in that a vertical guide slot (12) is provided on the oscillating intermediate part or the bottom part respectively and that a corresponding guide bolt or the like (11) is provided on the end wall of the casing.

Dated this 13th day of December, 1928.

S. SOKAL,  
1, Great James Street,  
Bedford Row, London, W.C.,  
Chartered Patent Agent.

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Fig. 1.

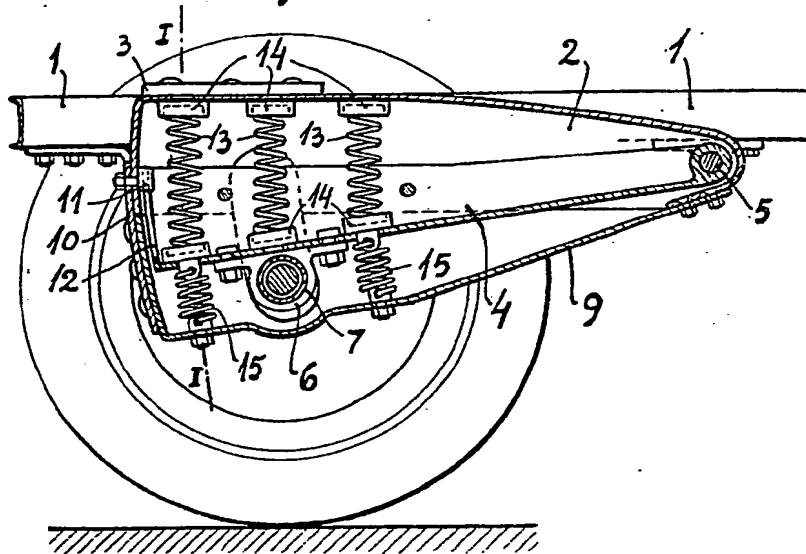


Fig. 2.

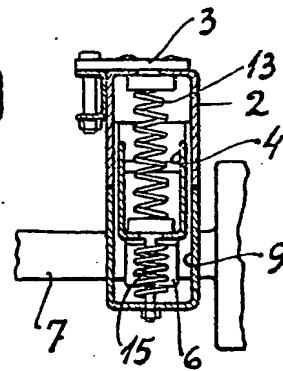


Fig. 3.

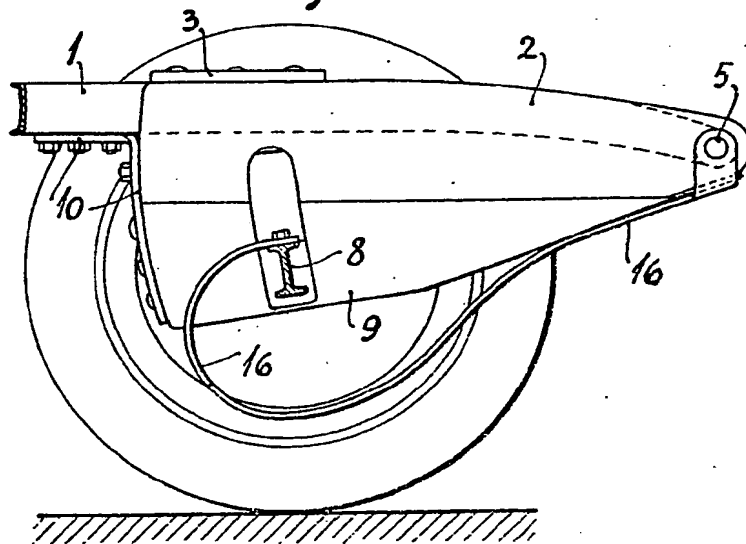
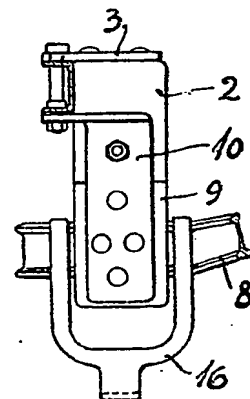


Fig. 4.



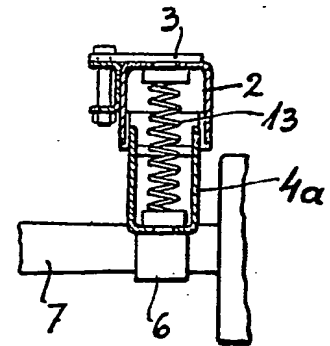
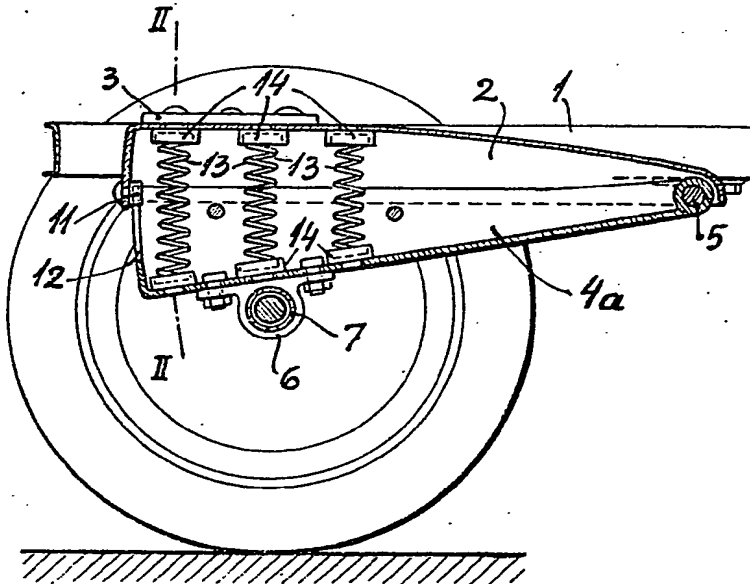
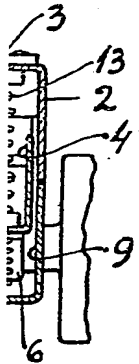
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Fig. 5.

Fig. 6.

1. 2.



7. 4.

Fig. 7.

Fig. 8.

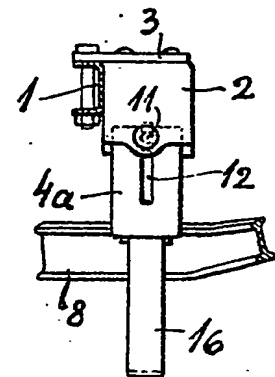
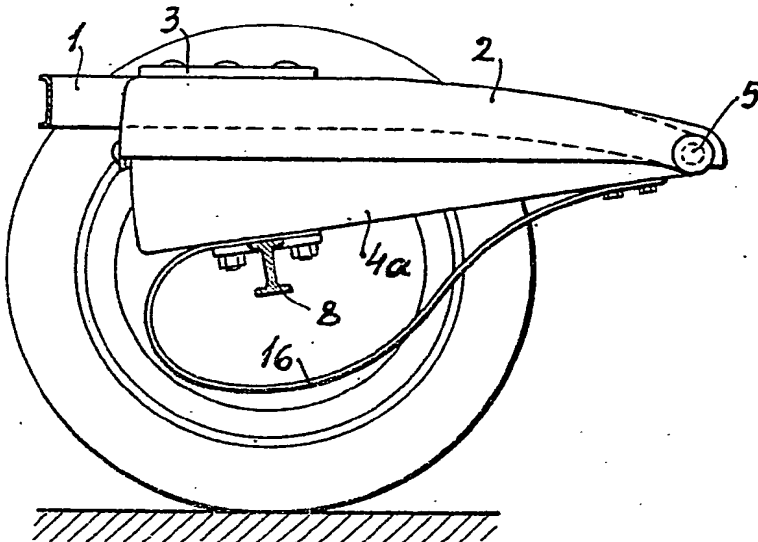
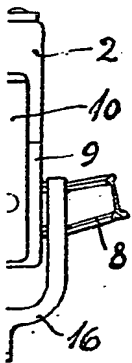


Fig. 6.

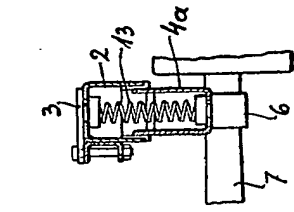


Fig. 5.

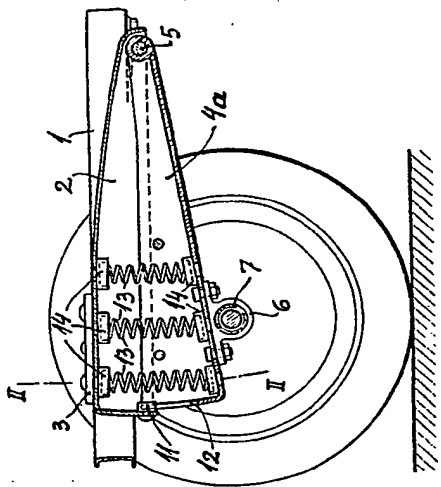


Fig. 8.

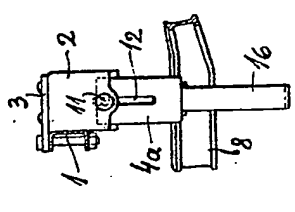


Fig. 7.

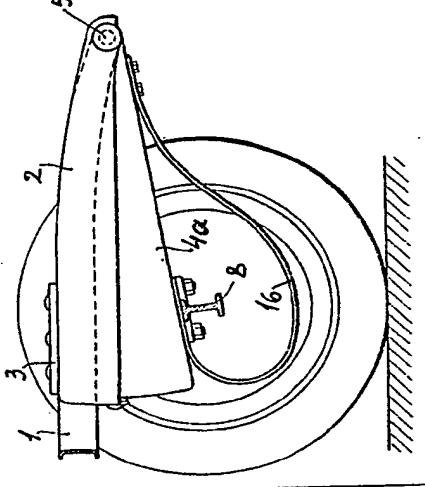


Fig. 2.

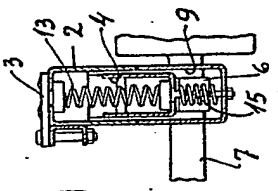


Fig. 1.

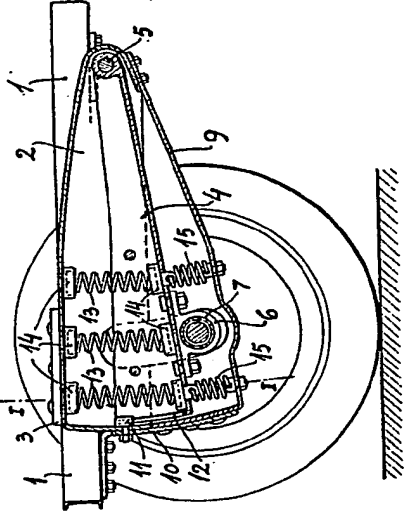


Fig. 4.

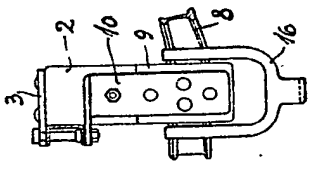
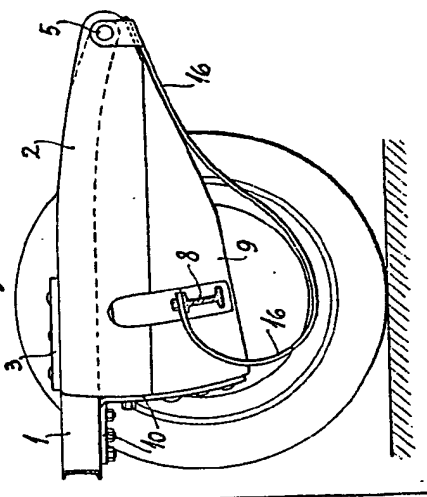


Fig. 3.



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